AMENDMENTS TO THE CLAIMS:

1. (Currently amended) A system for controlling a permanent magnet motor (12), comprising:

a motor controller (16), said motor controller (16) using phase currents of the permanent magnet electric motor (12) at a preset speed ω to generate voltage-controlling signals ~~in relation to both~~ used to obtain changes in ~~speed ω and~~ torque T of the permanent magnet electric motor (12); and

a power stage (14), said power stage (14) receiving the voltage-controlling signals from the motor controller (16) and feeding them back to the permanent magnet electric motor (12).

2. (Original) The system for controlling a permanent magnet electric motor (12) according to claim 1, wherein said permanent magnet electric motor (12) is a three-phase permanent magnet electric motor provided with a rotor and a stator, each one of the phases thereof carrying a current, i_a, i_b and i_c respectively.

3. (Previously presented) The system for controlling a permanent magnet electric motor according to claim 1, wherein said motor controller (16) is a park vector rotator unit that generates continuously rotating angles.

4. (Currently amended) The system for controlling a permanent magnet electric motor according to any one of claims 1 to 3, said system continuously responding to changes of the preset speed and torque of the permanent magnet electric motor (12) as well as to changes in ambient conditions.

5. (Currently amended) A method for controlling a permanent magnet electric motor (12) comprising:

determining a current of each phase of the permanent magnet electric motor (12) at a preset speed ω;

obtaining voltage controlling signals at the preset speed ω in relation to

~~both~~ changes in ~~speed and~~ torque of the permanent magnet electric motor (12); and

feeding the voltage controlling signal back to the permanent magnet electric motor (12).

6. (Currently amended) The method for controlling a permanent magnet electric motor according to claim 5, wherein said determining a current of each phase of the permanent magnet electric motor (12) comprises measuring a current of two phases thereof and calculating a current of a third phase using the relation: $\sum_{three\ phases} i = 0$ ~~(4)~~.

7. (Previously presented) The method for controlling a permanent magnet electric motor according to claim 5, further comprising computing a current torque T of the permanent magnet electric motor (12).

8. (Currently amended) The method for controlling a permanent magnet electric motor according to claim 7, wherein said computing a current torque T comprises rotating the currents of each phase of the permanent magnet electric motor by an angle $-\theta_n$ to output two currents I_d and I_q, according to the following relations on a d-q axis fixed on a rotor axis of the permanent magnet electric motor (12):

$$I_d = 2/3 \times [i_a \times \cos(\theta_n) + i_b \times \cos(\theta_n + 120°) + i_c \times \cos(\theta_n - 120°)] \cancel{(2)} \text{ and}$$

$$I_q = 2/3 \times [i_a \times \sin(\theta_n) + i_b \times \sin(\theta_n + 120°) + i_c \times \sin(\theta_n - 120°)] \cancel{(3)}.$$

9. (Previously presented) The method for controlling a permanent magnet electric motor according to claim 6, wherein said obtaining voltage controlling signals comprises:

computing a current rotating angle θ_{n+1};

computing two voltage outputs V_q and V_d; and

rotating the voltage outputs V_q and V_d by the angle θ_{n+1}.

10. (Currently amended) The method for controlling a permanent

magnet electric motor according to claim 9, wherein said computing a current rotating angle θ_{n+1} is done using a current torque T and ~~a~~ a preset speed ω of the permanent magnet electric motor (12) with the formula $\theta_{n+1} = \theta_n + k_1 \times \omega + k_2 \times T$ ~~(1)~~ where k_1 and k_2 are constants.

11. (Previously presented) The method for controlling a permanent magnet electric motor according claim 10, wherein said computing two voltage outputs V_q and V_d comprises:

computing the voltage output V_q on a d-q axis fixed on a rotor axis: $V_q = PI\,(I^* - I_d) + k_3 \times I_q$ where k_3 is a constant, "PI" referring to a proportional and integral operator, defined as follows: $PI(x) = ax + b\int x\,dt$ where a and b are constants and integration is over time; and

computing the voltage output V_d, according to the following equation on the d-q axis fixed on the rotor axis: $V_d = k_5 \times I_d + k_4 \times I_q \times \omega$ where k_4 and k_5 are constants.

12. (Previously presented) The method for controlling a permanent magnet electric motor according to claim 10, wherein said obtaining voltage controlling signals comprises obtaining three voltage controlling signals V_a, V_b and V_c according to the following equations: $V_a = V_d \times \cos(\theta_{n+1}) + V_q \times \sin(\theta_{n+1})$, $V_b = V_d \times \cos(\theta_{n+1}+120°) + V_q \times \sin(\theta_{n+1}+120°)$ and $V_c = V_d \times \cos(\theta_{n+1}-120°) + V_q \times \sin(\theta_{n+1}-120°)$.

13. (Previously presented) The method for controlling a permanent magnet electric motor according to claim 5, wherein constants are set based on a number of parameters selected in the group comprising a sampling rate of a computer to be used, conditions of a power drive, sensitivity of current sensors used for current measurements and characteristics of the permanent magnet electric motor (12).

14. (Currently amended) A circuit for controlling a permanent magnet

three-phases electric motor provided with a rotor and a stator, comprising:

a rotator allowing rotation of current signals of the phases of the permanent magnet electric motor (12) from a stationary frame to two decoupled current components in a rotor synchronous frame along a direct axis (I_d) and a quadrature axis (I_q) respectively;

a proportional and integral operator for deriving a voltage (V_q) along the quadrature axis and a voltage (V_d) along the direct axis;

a rotator allowing rotating the voltages V_q and V_d back from the rotor synchronous frame to the stationary frame to yield terminal voltages V_a, V_b and V_c of the permanent magnet electric motor;

wherein a current rotating angle θ_{n+1} is computed using a current torque T and a preset speed ω of the permanent magnet electric motor with a formula as follows: $\theta_{n+1} = \theta_n + k_1 \times \omega + k_2 \times T$ ~~(1)~~ where k_1 and k_2 are constants.

15. (Currently amended) A method for controlling a permanent magnet three-phases electric motor provided with a rotor and a stator, comprising:

rotating current signals of the phases of the permanent magnet electric motor (12) from a stationary frame to two decoupled current components in a rotor synchronous frame along a direct axis (I_d) and a quadrature axis (I_q) respectively;

deriving a voltage (V_q) along the quadrature axis therefrom;

deriving a voltage (V_d) along the direct axis;

rotating the voltages V_q and V_d back from the rotor synchronous frame to the stationary frame to yield terminal voltages V_a, V_b and V_c of the permanent magnet electric motor;

wherein a current rotating angle θ_{n+1} is computed using a current torque T and a preset speed ω of the permanent magnet electric motor (12) with a formula as follows: $\theta_{n+1} = \theta_n + k_1 \times \omega + k_2 \times T$ ~~(1)~~ where k_1 and k_2 are constants.

16. (Currently amended) A method for controlling a permanent magnet electric motor having three-phases each supporting a current i_a, i_b and i_c respectively, comprising:

determining the currents i_a, i_b and i_c;

rotating the currents i_a, i_b and i_c by an angle $-\theta_n$ to yield currents I_d and I_q;

computing a current torque of the permanent magnet electric motor (12);

computing a current rotating angle θ_{n+1};

computing a voltage output V_q;

computing a voltage output V_d;

rotating the voltages Vq and V_d by the rotating angle θn+1 to yield three voltage controlling signals V_a, V_b and V_c; and

applying the voltage controlling signals V_a, V_b and V_c to the permanent magnet electric motor;

wherein a current rotating angle θ_{n+1} is computed using the current torque T and a <u>preset</u> speed ω of the permanent magnet electric motor (12) with a formula as follows: $\theta_{n+1} = \theta_n + k_1 \times \omega + k_2 \times T$ ~~(1)~~ where k_1 and k_2 are constants.